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## (54) INFORMATION PROVIDING SYSTEMITS METHOD AND CLIENT

(57)Abstract:
PROBLEM TO BE SOLVED: To provide information providing system and method capable of improving the efficiency of communication in accordance with the acquisition of information provided from an information source server to a client whose throughput is low and to provide a client for efficiently acquiring various kinds of information provided by the server even when the throughput is low.
SOLUTION: The client 20 requesting the acquisition of various kinds of information stored in the information source server 21 receives the information acquired from the server 21 temporarily stored in a cache memory 25 by an agent program 28 stored in a GW device 23 through the GW device 23 in accordance with the profile information of the client 20the preference information of the user and the communication attribute information of a data communication network while effectively utilizing a data communication network. The client 20 stores the information received from the GW device 23 in a cache memory 26 based on attribute information 27 and recompiles the stored information in each access while considering the relationship of the stored information.

## CLAIMS

[Claim(s)]
[Claim 1]A server which performs an offer of information to a predetermined acquisition requestand an accumulation means which accumulates information provided by said serverAn accumulation discriminating means which distinguishes

whether information which carries out an acquisition request to said server is accumulated in this accumulation meansAn acquisition request means which carries out an acquisition request of said information to said server via a data communication network when said information was not accumulated by this accumulation discriminating means and it is distinguishedAn information processing means which performs predetermined Data Processing Division to said one of information acquired corresponding to an acquisition request by said information which is accumulated in said accumulation meansand by which the acquisition request was carried outor said acquisition request means when said information was accumulated by said accumulation discriminating means and it is distinguishedA storing discriminating means which distinguishes whether information acquired from a storage condition of said accumulation means corresponding to said acquisition request is storable in said accumulation meansAn information reduction means to reduce the amount of information of provided information of said server accumulated in said accumulation means searched based on attribution information which consists of client information and a user's idea information which show self throughput etc. when unstorable by this storing discriminating means and it is distinguishedAn information service system possessing a client provided with an information storing means which stores information acquired by this information reduction means by said accumulation means by which said amount of information was reduced corresponding to said acquisition request.

[Claim 2]The information service system according to claim 1 provided with a gateway characterized by comprising the following.

An acquisition request reception means which receives an acquisition request by said acquisition request means via said data communication network.

2nd acquisition request means to require said acquisition of information by which the acquisition request was carried out via said 2nd data communication network from said server based on communication attribute information which shows communication capability of a data communication network between said attribution information and said clientand the 2nd data communication network between said servers.

The 2nd accumulation means that accumulates information acquired corresponding to an acquisition request by this 2nd acquisition request means.

An Information Transfer Sub-Division means to transmit information accumulated in said 2nd accumulation means to said client via said data communication network based on said attribution information and said communication attribute information.

[Claim 3]The information service system according to claim 1 or 2wherein said server is what performs an offer of information to said predetermined acquisition request based on said attribution information notified by said client and said communication attribute information.

[Claim 4]The information service system according to claim 1 to 3wherein said client is provided with an attribution information alteration means which changes either one of said attribution information and said communication attribute information at least dynamically.

[Claim 5]An accumulation discriminating step which distinguishes whether it is accumulated in cache memory of a client in which information which carries out an acquisition request to a server has accumulated provided information from said server beforehandAn acquisition request step which carries out an acquisition request of said information to said server via a data communication network when said information was not accumulated by this accumulation discriminating step and it is distinguishedAn offer-of-information step which a server provides with information by which the acquisition request was carried out at this acquisition request stepA storing discriminating step which distinguishes whether information provided at this offer-of-information step is storable from a storage condition of said cache memoryAn information reduction step which reduces the amount of information of provided information of said server accumulated in said cache memory searched based on attribution information which consists of client information and a user's idea information which show self throughput etc. when unstorable by this storing discriminating step and it is distinguishedAn information service method possessing an information storing step which stores information with which said cache memory by which said amount of information was reduced at this information reduction step was provided at said offer-of-information step.

[Claim 6]An accumulation discriminating step which distinguishes whether it is accumulated in cache memory of a client in which information which carries out an acquisition request to a server has accumulated provided information from said server beforehandAn acquisition request step which carries out an acquisition request of said information to said server via a data communication network when said information was not accumulated by this accumulation discriminating step and it is distinguishedAn acquisition request receiving step to which a gateway receives an acquisition request in this acquisition request step via said data communication networkThroughput of said clientetc. Based on communication attribute information which shows communication capability of a data communication network between attribution information which consists of client information and a user's idea information which are shownand said clientand the 2nd data communication network between said serversto said serversaid acquisition of information by which the acquisition request was carried out. The 2nd acquisition request step demanded via said 2nd data communication networkAn offer-of-information step which a server provides with information by which the acquisition request was carried out at this 2nd acquisition request stepand the 2nd accumulation step that accumulates information for which it was provided at this offer-of-information step via said 2nd data communication network in the 2nd cache memory of a gatewayThe Information

Transfer Sub-Division step which transmits said information accumulated at this 2nd accumulation step to said client via said data communication network based on said attribution information and said communication attribute informationA storing discriminating step which distinguishes whether information transmitted at this Information Transfer Sub-Division step is storable from a storage condition of said cache memoryAn information reduction step which reduces the amount of information of provided information of said server accumulated in said cache memory searched based on attribution information which consists of client information and a user's idea information which show self throughput etc. when unstorable by this storing discriminating step and it is distinguishedAn information service method possessing an information storing step which stores information transmitted to said cache memory by which said amount of information was reduced at this information reduction step at said Information Transfer Sub-Division step.

[Claim 7]The information service method according to claim 5 or 6 with which said offer-of-information step is characterized by said server performing an offer of information based on said attribution information notified by said client and said communication attribute information.

[Claim 8]A client comprising:

An accumulation means which accumulates information provided by server which performs an offer of information to a predetermined acquisition request.

An accumulation discriminating means which distinguishes whether information which carries out an acquisition request to said server is accumulated in this accumulation means.

An acquisition request means which carries out an acquisition request of said information to said server via a data communication network when said information was not accumulated by this accumulation discriminating means and it is distinguished.

An information processing means which performs predetermined Data Processing Division to said one of information acquired corresponding to an acquisition request by said information which is accumulated in said accumulation meansand by which the acquisition request was carried outor said acquisition request means when said information was accumulated by said accumulation discriminating means and it is distinguishedA storing discriminating means which distinguishes whether information acquired from a storage condition of said accumulation means corresponding to said acquisition request is storable in said accumulation meansAn information reduction means to reduce the amount of information of provided information of said server accumulated in said accumulation means searched based on attribution information which consists of client information and a user's idea information which show self throughput etc. when unstorable by this storing discriminating means and it is distinguishedAn information storing means which stores information acquired by this information reduction means by said accumulation means by which said amount of information was reduced corresponding to said acquisition request.

[Claim 9]Information acquired corresponding to an acquisition request by said acquisition request meansA gateway which received said acquisition request acquires from said server via said 2nd data communication network based on communication attribute information which shows communication capability of a data communication network between said attribution information and said clientand the 2nd data communication network between said serversThe client according to claim 8 being the information transmitted via said data communication network based on said attribution information and said communication attribute information.
[Claim 10]The client according to claim 8 or 9wherein information acquired corresponding to an acquisition request by said acquisition request means is information provided by said server based on said attribution information and said communication attribute information.
[Claim 11]The client according to claim 8 to 10 provided with an attribution information alteration means for changing dynamically either one of said attribution information and said communication attribute information at least.
[Claim 12]The client according to claim 8 to 11wherein said information reduction means is what deletes information that a priority searched based on said attribution information is low.
[Claim 13]The client according to claim 8 to 12wherein said information reduction means is what compresses information retrieved based on said attribution information.
[Claim 14]Said information is mutually linked with menu data which is menu data for choosing what carries out an acquisition requestand is other information acquired corresponding to each selectionsSaid information storing means is a thing to which an availability of said accumulation means is made to increase based on a link generated between these menu data whenever it stores in said accumulation means menu data acquired corresponding to an acquisition request by said acquisition request means. The client according to claim 8 to 13 characterized by a certain thing.
[Claim 15]The client according to claim 8 to 14wherein said attribution information is what is set up for every use tendency for which it opted beforehand.
[Claim 16]The client according to claim 15wherein said attribution information is what can be changed into what is sold for every use tendency for which it opted beforehand.

## DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention]This invention relates to the client which acquires the variety of information provided by the information service systeminformation service

methodand sources-of-information server which acquire the variety of information provided by the sources-of-information server via a data communication network.
[0002]
[Description of the Prior Art]The information stored in the server built on the Internet by which various computer networks were connected mutually from clientssuch as a computer terminal installed in the ordinary home or the officecan be easily perused now with development of information processing technique or communication technology. The information terminal in which the data communications by radio are possible as a client especiallyThe information access by the portable information machines and equipment of a cellular phone or a Personal Handyphone System (below Personal Handy-phone System: abbreviates to PHS.) becomes possibleand the spread is remarkable. Access to the sources-of-information server in which the variety of information on the Internet which makes such a personal digital assistant a client was stored is performed via the gateway (below GateWay: abbreviates to GW.) device from the former.
[0003]Drawing 12 expresses an example of the composition of the conventional information service system for a client to acquire the information provided by the sources-of-information server via a gateway unit. The clients 10such as a radio personal digital assistant in the conventional information service systemIn order to acquire the variety of information stored in the sources-of-information server 11 connected to the InternetGW device 13 connected via the data communication network 12 in which the data communications by this sources-of-information server 11a cableor radio are possible is used. The client 10 is connected with this GW device 13 via the data communication network 14 in which the data communications by a cable or radio are possible.
[0004]In order for GW device 13 to absorb a difference of the secrecy method of the commo data of the data communication networks 12 and 14and a difference of bandwidth and a transmission delay amount and to reduce the load in the data communication network 12 as much as possibleIt has the cache memory 15 and the information from the sources-of-information server 11 which had the access request from the client 10 is accumulated temporarily. That isif the information access demand from the client 10 is received via the data communication network 14GW device 13 acquires required information from the sources-of-information server 11will packet-ize this and will accumulate it in the cache memory 15 temporarily. When there is an information access demand to the same sources-of-information server 11 again from the client 10 by thisGW device 13 cannot be connected to the sources-of-information server 11but the accumulation information of the cache memory 15 can be transmitted to the client 10and the load accompanying the unnecessary data communications of the data communication network 12 can be excluded.
[0005]Howeverin order to perform data transfer from the sources-of-information server 11 via the data communication network 12 to unnecessary information for the

client 10 or its userthe utilization efficiency of not only the data communication network 12 but the data communication network 14 falls. Thereforethe capacity of the cache memory 15 of GW device 13 is consumed vainlyFor exampleaccess to the accumulation information of the same sources-of-information server occurs from the client 10 repeatedlyand apply load to GW device 13orThe inconvenience of not being provided when the information which the information provider who manages the sources-of-information server 11 meant should be provided to the client 10 by the congestion generated in the data communication networks 12 and 14 or an overload may arise.

[0006]Thenthe profile information which is the attribution information which shows a display or throughput of the client 10The preference information which is the attribution information which shows the selection criterion and idea of information required for the user of the client 10 is usedThe art about the information service system which enabled it to acquire the information needed for the client 10 or its user with the minimum traffic is proposed variously.

[0007]For examplein JPH11-55324A "communications system of a computer network." By the agent who mounted in the clientthe GW deviceand the server beforehandrespectively. By exchanging the profile information of many capabilitysuch as bandwidth of a data communication networkand a size of the display screen of a clientmutuallythe art about the information service system which aims at effective use of a resource required for Information Transfer Sub-Division at the whole system is indicated.

[0008]To JPH11-96099A "service provision system." When the preference information which consists of a client user's tastea utilization historyetc. is stored in a GW device and a GW device receives the information access demand from a clientThe art about the information service system which determined the information which should be provided to a client based on this preference information is indicated.

[0009]

[Problem(s) to be Solved by the Invention]Howeverin the art indicated by JPH11-55324Aby cooperation processing between the agents mounted in a clienta GW deviceand each serveralthough decentralization of load and communication efficiency-ization of the whole system can be attainedWhen a client is a personal digital assistant which a miniaturization like a cellular phone with remarkable spread or PHS is required in recent yearsand cannot expect high throughputthere is a problem that application is difficult. That isthe low client of throughput requires load in connection with the cooperation processing between agentsand the communications processing between GW devices 13. It becomes inconvenient [ for a client user ] in respect of such communication cost further again.

[0010]Although communication efficiency-ization of the whole system can be attained in the art indicated by JPH11-96099A by raising the accuracy of the taste of the information which the user of a client needs in a GW deviceAs for the amount of

communications processing between a client and a GW deviceit is not reduced so much butin the case of the low client of throughputthere is a problem in respect of a processing load and communication cost similarly.
[0011]When a client with low throughput performs mobile communicationsIn spite of making the contents of the sources-of-information server with access peruse by hand-off control of the higher-rank office which makes a client a subordinate as promptly as possible or eliminating an unnecessary E-mail and contentsThe throughput of mobile communications is made to fall remarkably with the processing load accompanying the communications processing between GW devicesetc.
[0012]Thenan information service system and an information service method which attain communication efficiency-ization accompanying acquisition of the information provided with the purpose of this invention by the sources-of-information server to the low client of throughputEven if it is when throughput is lowit is in providing the client which acquires efficiently the variety of information provided by the sources-of-information server.
[0013]
[Means for Solving the Problem]A server which performs an offer of information to a (b) predetermined acquisition request in the invention according to claim 1(**) An accumulation means which accumulates information provided by serverand an accumulation discriminating means which distinguishes whether information which carries out an acquisition request to a server is accumulated in this accumulation meansAn acquisition request means which carries out an acquisition request of information to a server via a data communication network when information was not accumulated by this accumulation discriminating means and it is distinguishedAn information processing means which performs predetermined Data Processing Division to one of information acquired corresponding to an acquisition request by information or an acquisition request means which is accumulated in an accumulation meansand by which the acquisition request was carried out when information was accumulated by accumulation discriminating means and it is distinguishedA storing discriminating means which distinguishes whether information acquired from a storage condition of an accumulation means corresponding to an acquisition request is storable in an accumulation meansAn information reduction means to reduce the amount of information of provided information of a server accumulated in an accumulation means searched based on attribution information which consists of client information and a user's idea information which show self throughput etc. when unstorable by this storing discriminating means and it is distinguishedAn information service system is made to possess a client provided with an information storing means which stores information acquired by this information reduction means by accumulation means by which the amount of information was reduced corresponding to an acquisition request.
[0014]Namelyin an information service system which consists of a server which performs an offer of informationand a client which performs an acquisition request of

information to this server in the invention according to claim 1It has an accumulation means which accumulates acquisition information from a server in a clientand when an acquisition request of information over a server occurredand accumulation existence of information which carries out an acquisition request to an accumulation means by an accumulation discriminating means is distinguishedit was accumulated and it is distinguishedpredetermined Data Processing Division is performed to this accumulated information. When information which carries out an acquisition request to an accumulation means by an accumulation discriminating means was not accumulated and it is distinguished on the other handan acquisition request is performed to a server via a data communication network for the first time. And when information is acquired corresponding to this acquisition requestpredetermined Data Processing Division is performed to this information. And information newly acquired from a server by an information storing meansAfter reducing the amount of information of provided information from a server accumulated in an accumulation means searched based on attribution information which consists of client information and a user's idea information which show self throughput etc. and making an availability of an accumulation means increaseit stores in an accumulation means.

[0015]An acquisition request reception means which receives an acquisition request by an acquisition request means via a data communication network with the information service system according to claim 1 in the invention according to claim 22nd acquisition request means to require acquisition of information by which the acquisition request was carried out to a server based on communication attribute information which shows communication capability of a data communication network between attribution information and a clientand the 2nd data communication network between servers via the 2nd data communication networkThe 2nd accumulation means that accumulates information acquired corresponding to an acquisition request by this 2nd acquisition request meansIt is characterized by having a gateway provided with an Information Transfer Sub-Division means to transmit information accumulated in the 2nd accumulation means to a client via a data communication network based on attribution information and communication attribute information.

[0016]That isin the invention according to claim 2a gateway is made to intervene between a client and a server to the invention according to claim 1and transmission and reception of information are enabled via a data communication network and the 2nd data communication networkrespectively. This gateway once receives an acquisition request of information over a server from a clientand makes an acquisition request of information by which the acquisition request was carried out to a server by the 2nd acquisition request means based on communication attribute information which shows communication capability of attribution informationa data communication networkand the 2nd data communication network perform. And when information is acquired from a server corresponding to this acquisition requestit is made to accumulate in the 2nd accumulation meansand information accumulated in the 2nd

accumulation means via a data communication network to a client is made to transmit based on attribution information and communication attribute information further.
[0017]In the invention according to claim 3a server is characterized by being what performs an offer of information to a predetermined acquisition request based on attribution information and communication attribute information which were notified by client with the information service system according to claim 1 or 2.
[0018]In the invention according to claim 4it is characterized by providing a client with an attribution information alteration means which changes either one of attribution information and communication attribute information at least dynamically with the information service system according to claim 1 to 3.
[0019]An accumulation discriminating step which distinguishes whether it is accumulated in cache memory of a client in which information which carries out an acquisition request to a (b) server has accumulated provided information from a server beforehand in the invention according to claim 5(**) An acquisition request step which carries out an acquisition request of information to a server via a data communication network when information was not accumulated by this accumulation discriminating step and it is distinguished(**) An offer-of-information step which a server provides with information by which the acquisition request was carried out at this acquisition request step(**) A storing discriminating step which distinguishes whether information provided at this offer-of-information step is storable from a storage condition of cache memory(**) An information reduction step which reduces the amount of information of provided information of a server accumulated in cache memory searched based on attribution information which consists of client information and a user's idea information which show self throughput etc. when unstorable by this storing discriminating step and it is distinguished(**) Make an information service method possess an information storing step which stores information with which cache memory by which the amount of information was reduced at this information reduction step was provided at an offer-of-information step.
[0020]Namelyit is distinguished whether it is accumulated in cache memory which has accumulated beforehand provided information from a server which information which carries out an acquisition request to a server already acquired from a client in the invention according to claim 5When information was not accumulated and it is distinguishedan acquisition request of information is performed to a server via a data communication networkA server provides this information by which the acquisition request was carried outAfter a client makes an availability of cache memory increase based on attribution information which consists of client information and a user's idea information which show self throughput etc.he is trying to store in cache memory information provided from a server.
[0021]An accumulation discriminating step which distinguishes whether it is accumulated in cache memory of a client in which information which carries out an

acquisition request to a (b) server has accumulated provided information from a server beforehand in the invention according to claim 6(**) An acquisition request step which carries out an acquisition request of information to a server via a data communication network when information was not accumulated by this accumulation discriminating step and it is distinguished(**) An acquisition request receiving step to which a gateway receives an acquisition request in this acquisition request step via a data communication network(**) Throughput of a clientetc. Acquisition of information by which the acquisition request was carried out to a server based on communication attribute information which shows communication capability of a data communication network between attribution information and a client which consist of client information and a user's idea information which are shownand the 2nd data communication network between servers. The 2nd acquisition request step demanded via the 2nd data communication networkand an offer-of-information step which a (**) server provides with information by which the acquisition request was carried out at this 2nd acquisition request step(**) The 2nd accumulation step that accumulates information provided at this offer-of-information step via the 2nd data communication network in the 2nd cache memory of a gateway(**) The Information Transfer Sub-Division step which transmits information accumulated at this 2nd accumulation step to a client via a data communication network based on attribution information and communication attribute information(**) A storing discriminating step which distinguishes whether information transmitted at this Information Transfer Sub-Division step is storable from a storage condition of cache memory(**) An information reduction step which reduces the amount of information of provided information of a server accumulated in cache memory searched based on attribution information which consists of client information and a user's idea information which show self throughput etc. when unstorable by this storing discriminating step and it is distinguished(**) Make an information service method possess an information storing step which stores information transmitted to cache memory by which the amount of information was reduced at this information reduction step at the Information Transfer Sub-Division step.

[0022]Namelyit is distinguished whether it is accumulated in cache memory which has accumulated beforehand provided information from a server which information which carries out an acquisition request to a server already acquired from a client in the invention according to claim 6When information was not accumulated and it is distinguishedan acquisition request of information is performed to a server via a data communication networkA gateway receives the acquisition requestThis gateway receives a server based on communication attribute information which shows communication capability of attribution information which consists of client information and a user's idea information which show throughput of a clientetc.a data communication networkand the 2nd data communication network between servers. Acquisition of information in which a client carried out the acquisition request via the

2nd data communication network is requiredA server provides this information by which the acquisition request was carried outand a gateway accumulates this provided informationA gateway transmits this accumulated information to a client via a data communication network based on attribution information and communication attribute informationAfter a client makes an availability of cache memory increase based on attribution informationhe is trying to store in cache memory information provided from a server.

[0023]In the invention according to claim 7an offer-of-information step is characterized by a server performing an offer of information based on attribution information and communication attribute information which were notified by client with the information service method according to claim 5 or 6.

[0024]An accumulation means which accumulates information provided in the invention according to claim 8 by server which performs an offer of information to a (b) predetermined acquisition request(**) An accumulation discriminating means which distinguishes whether information which carries out an acquisition request to a server is accumulated in this accumulation means(**) An acquisition request means which carries out an acquisition request of information to a server via a data communication network when information was not accumulated by this accumulation discriminating means and it is distinguished(**) An information processing means which performs predetermined Data Processing Division to one of information acquired corresponding to an acquisition request by information or an acquisition request means which is accumulated in an accumulation meansand by which the acquisition request was carried out when information was accumulated by accumulation discriminating means and it is distinguished(**) A storing discriminating means which distinguishes whether information acquired from a storage condition of an accumulation means corresponding to an acquisition request is storable in an accumulation means(**) An information reduction means to reduce the amount of information of provided information of a server accumulated in an accumulation means searched based on attribution information which consists of client information and a user's idea information which show self throughput etc. when unstorable by this storing discriminating means and it is distinguished(**) Make a client possess an information storing means which stores information acquired by this information reduction means by accumulation means by which the amount of information was reduced corresponding to an acquisition request.

[0025]Namelyit has an accumulation means which accumulates provided information from a server which performs an offer of information in the invention according to claim 8Accumulation existence of information which carries out an acquisition request to an accumulation means by an accumulation discriminating means when an acquisition request of information over a server occurs is distinguishedInformation which performed an acquisition request to a server via a data communication network for the first timeand was acquired corresponding to this when were not accumulated

and it was distinguished by an information storing means. After making an availability of an accumulation means increasehe is trying to store in an accumulation means based on attribution information which consists of client information and a user's idea information which show self throughput etc.
[0026]In the invention according to claim 9information acquired by the client according to claim 8 corresponding to an acquisition request by an acquisition request meansA gateway which received an acquisition request acquires from a server via the 2nd data communication network based on communication attribute information which shows communication capability of a data communication network between attribution information and a clientand the 2nd data communication network between serversIt is characterized by being the information transmitted via a data communication network based on attribution information and communication attribute information.
[0027]Namelyinformation acquired in the invention according to claim 9 corresponding to an acquisition request by an acquisition request meansBased on communication attribute information a gateway which received an acquisition request indicates communication capability of a data communication network between attribution information and a clientand the 2nd data communication network between servers to be by a gatewayit is acquired from a server via the 2nd data communication networkFurthermore based on attribution information and communication attribute informationit should be transmitted via a data communication network.
[0028]In the invention according to claim 10information acquired by the client according to claim 8 or 9 corresponding to an acquisition request by an acquisition request means is characterized by being the information provided by server based on attribution information and communication attribute information.
[0029]Namelyin Claim 3Claim 7and the invention according to claim 10. It was made to provide information which a server furthermore also stores beforehand in consideration of a transferring amount and transfer timing to an acquisition request of information from a client based on attribution information and communication attribute information which were notified from a client.
[0030]In the invention according to claim 11it is characterized by having an attribution information alteration means for changing dynamically either one of attribution information and communication attribute information at least by the client according to claim 8 to 10.
[0031]That isit enables it to change dynamically either one of attribution information and communication attribute information from a client at least in Claim 4 and the invention according to claim 11.
[0032]In the invention according to claim 12it is characterized by an information reduction means being what deletes information that a priority searched based on attribution information is low by the client according to claim 8 to 11.
[0033]That isin the invention according to claim 12after analyzing a priority based on attribution information and deleting what has a low priority from information

accumulated in an accumulation meansacquisition information which should be registered newly was stored.
[0034]In the invention according to claim 13it is characterized by an information reduction means being what compresses information retrieved based on attribution information by the client according to claim 8 to 12.
[0035]That isafter retrieving information which should be compressed based on attribution information in the invention according to claim 13 from information accumulated in an accumulation means and compressing retrieved informationacquisition information which should be registered newly was stored.
[0036]In the invention according to claim 14by the client according to claim 8 to 13. Information is mutually linked with menu data which is menu data for choosing what carries out an acquisition requestand is other information acquired corresponding to each selectionsIt is characterized by an information storing means being a thing to which an availability of an accumulation means is made to increase based on a link generated between these menu data whenever it stores in an accumulation means menu data acquired corresponding to an acquisition request by an acquisition request means.
[0037]Namelyit is considered as a menu screen unit which displays an information unit in which a client carries out an acquisition request on a display screen in the invention according to claim 14Information is acquired to a menu data unit corresponding to each selections for displaying a menu screen corresponding to selections displayed by each menu screenSince it was made to make an availability of an accumulation means increase based on a link between each menu dataonly information with a tendency which strong information on relevance is accumulated in an accumulation meansand I am [ information ] easyand is used can be used efficientlyand access to a server can be decreased.
[0038]In the invention according to claim 15it is characterized by attribution information being what is set up for every use tendency for which it opted beforehand by the client according to claim 8 to 14.
[0039]That isin the invention according to claim 15since attribution information is set as each client for every use tendency for which it opted beforehandthe user can acquire high information on a possibility that self will requirepromptly and efficientlyand aims at coexistence with convenience for a userand communicative increase in efficiency.
[0040]In the invention according to claim 16it is characterized by attribution information being what can be changed into what is sold for every use tendency for which it opted beforehand by the client according to claim 15.
[0041]That isin the invention according to claim 16for a user of a clienta user-friendly client can be provided and a sales network of a client can be further expanded by selling the attribution information according to a use tendency itselfand enabling it to set it as a client.

[0042]
[Embodiment of the Invention]
[0043]
[Example]This invention is explained in detail per working example below.
[0044]The 1st working example[0045]Drawing 1 expresses the outline of the composition of the information service system in the 1st working example of this invention. In the information service system in the 1st working example. In order that the clients 20such as a personal computer and a cellular phonemay access the variety of information stored in the sources-of-information server 21 connected to the InternetGW device 23 connected via the data communication network 22 in which the data communications by this sources-of-information server 21a cableor radio are possible is used. The client 20 is connected with this GW device 23 via the data communication network 24 in which the data communications by a cable or radio are possible.
[0046]In order for GW device 23 to absorb a difference of the secrecy method of the commo data of the data communication networks 22 and 24and a difference of bandwidth and a transmission delay amount and to reduce the load in the data communication network 22 as much as possibleIt has the cache memory 25 and the information from the sources-of-information server 21 which had the access request from the client 20 is accumulated temporarily.
[0047]The client 20 is also provided with the cache memory 26and aims at reuse of the past acquisition information for the purpose of efficient exploitation of a communication resource. It is reconstructing the acquisition information which the client's 20 memorized the attribution information 27 which consists of profile information and preference informationand was accumulated in the cache memory 26 based on this attribution information 27 furthermoreThe information optimal for the user of a client can be provided now.
[0048]Such the client 20 and GW device 23A central processing unit which is not illustratedrespectively (below Central Processing Unit:.) It abbreviates to CPU. It has and various control can be performed now according to the program stored in predetermined memory storagesuch as read-only memory (Read Only Memory:ROM).
[0049]The agent program 28 is stored in predetermined memory storageand GW device 23 is suitably read by CPU and is performed by it. The profile attribute of the client 20 to which the agent program 28 was transmitted by the client 20Based on the communication attribute information on the data communication networks 22 and 24and the preference attribute of the user of the client 20change control of the information with which the client 20 should be provided is performed.
[0050]As a profile attribute of the client 20For examplethe capacity of the receive buffer of the client 20its storing residuethe size of a viewing areaThere are the number of bits of a foreground colorbattery residual quantityan input methodand throughputWorld Wide Web Consortium (the.) World. CC/PP (Composite

Capability/Preference Profile) and the wireless application protocol forum (Wireless.) upon which it is decided by Wide Web Consortium:W3C It applies to the UAPROF (User Agent PROFile) specification currently examined in the Application Protocol Forum:WAP forum.

[0051]As communication attribute information on the data communication networks 22 and 24there are transceiver profilessuch as specification of the transmission capacity of the data communication networks 22 and 24a transmission delay amounthalf duplexor a full duplex or sending and receiving timingfor example.

[0052]As a preference attribute of the user of the client 20In order to express a user's idea and likingthere is filtering specification which shows the information which should be thinned out and carried out according to the priority of each [ automatic processing and ] information that the access round of the classification of the sources-of-information server 21access frequency and access timingor a server is specifiedfor exampleetc.and it applies to the specification similarly mentioned above. The user of the client 20 can change now suitably the profile attributecommunication attribute informationand preference attribute which were mentioned above.

[0053]Drawing 2 expresses the outline of a series of information acquisition sequences of the information service system in such 1st working example. The client 20 which received the address which specifies the sources-of-information server 21 which should be accessed from a user transmits the contents request 30 including the received address to GW device 23 via the data communication network 24. GW device 23 transmits the contents request 31 via the data communication network 22 to the sources-of-information server 21 by which the access request was carried out while storing this contents request in the cache memory 25. Under the present circumstancesbased on a profile attributea preference attributeand the communication attribute information on a data communication networkGW device 23The load which performs an access round as opposed to the sources-of-information server 21and is applied to a data communication network is reducedand acquisition of information is required from the sources-of-information server 21 so that it may become efficient for the communication capability of a client.

[0054]By the received contents request 31various contents take out the contents by which the acquisition request was carried outand reply the sources-of-information server 21 stored beforehand to GW device 23 as the contents 32.

[0055]GW device 23 is made to cater to the contents request 30 stored in the cache memory 25 in advance of this when the contents 32 were receivedand the packet-ized contents 32 are stored in the cache memory 25 (storing 33). The profile attribute information on the client 20 that GW device 23 was beforehand memorized by the agent program 28Filtering processing 34 is performed based on the communication attribute information and preference attribution information of the data communication networks 22 and 24and the information which should be provided from the contents stored in the cache memory 25 to the client 20 is changed. For

exampleit doubles with the idea of the user of the throughput and display ability of the client 20and the client 20picture information [ high definition / in changing the quantity of information as picture information corresponding to monochrome image information for color image information ] -- low -- an efficient offer of informationsuch as considering it as image quality picture informationchanging the quality of information or changing the timing of the information which should be transmittedis performed. Thusthe informationas forfiltering processing was carried out by the agent program 28 of GW device 23 is transmitted to the client 20 as the contents 35.

[0056]In the information service system in the 1st working exampleFurthermorethe client 20 can display the information received from GW device 23 with the optimal gestalt for the user of a client on the indicator which is not illustratedfor example based on the attribution information 27 which consists of profile information and preference information. Hereafterthe client 20 which enables such control is explained.

[0057]In order that the client 20 may reuse informationincluding the contents etc. which received from GW device 23 to the cache memory 26it memorizes pertinent informationsuch as an identifier of the sources-of-information server 21with this receipt informationand retrieves this memory information at every access of a sources-of-information server.

[0058]Drawing 3 expresses the outline of the composition of the memory information on such cache memory 26. In the cache memory 26 of the client 20. It corresponds to URL(Uniform ResourceLocators) 40 used for exampleon the Internet as an identifier of the sources-of-information server 21The capacity 41 of receipt information when the sources-of-information server specified by this URL40 from GW device 23 in the past is accessedthe information kind 42and the receipt information 43 for identifying graphic informationtextor sound information are memorized.

[0059]Drawing 4 expresses an example of the contents of processing of the sources-of-information server access processing stored in the predetermined memory storage processed by CPU which the client 20 does not illustrate. Namelythe client 20 is supervising the acquisition request from the user to the contents stored in the predetermined sources-of-information server on the Internet (step S50:N)When this contents acquisition request is detected as specification of the sources-of-information server of the request destination identified by URL (step S50:Y)the cache memory 26 is accessed first and the past access history is referred to.

[0060]Thereforeit is distinguished whether the client 20 has the same contents as what it was acquired from the same sources-of-information server in the pastand a user demands this time by accessing the cache memory 26 and comparing specified URL as a search key (Step S51). When there was a search key in agreement as a result of collation of a search key and it is distinguished (step S52:Y)the information memorized corresponding to URL which is a search key is taken out from cache memoryand it restores (Step S53). When there was no search key in agreement as a

result of collation of a search key and it is distinguished on the other hand (step S52:N)The contents which performed the communication interface to GW device 23 via the data communication network 24 by the communication processing part which is not illustratedand carried out the acquisition request from the sources-of-information server of specified URL are received (Step S54).

[0061]Thusacquisition of the contents demanded from the cache memory 26 or a sources-of-information server will reconstruct the composition in the cache memory 26 (Step S55). That isbased on the profile information and the preference information on the client 20 which were beforehand memorized as the attribution information 27the information which should be accumulated in the cache memory 26 is arranged so that the client 20 or the information optimal for the user can be provided. Thento the contents acquired in Step S53 or Step S54Data Processing Division predetermined [such as Image Processing Division and display processing] is performed (Step S56)and a series of processings are ended (return).

[0062]Nextafter explaining the information accumulated in the cache memory 26reorganization control of the accumulation information of the cache memory 26 of the client 20 mentioned above is explained.

[0063]Drawing 5 expresses notionally signs that the information received from the sources-of-information server 21 is accumulated in the cache memory 26 of the client 20. Herethe information 70-76 is displayed on the indicator which the client 20 does not illustraterespectivelyor shows each information to which predetermined reception is carried outand shows the size of the amount of information in the size of a figure. For examplethe amount of information of the information 71 shows that it is larger than the amount of information of the information 73. Herewhen each information is used as the menu data for one screen in the indicator which the client 20 does not illustrateeach information is related with other information for one screen corresponding to the selections of a menu screenand is linked. The arrow which connects each information shows this linkand let direction of an arrow be a transition direction.

[0064]If the client 20 uses the information 70 as powering on or initial menu data when initializedThe information 71 is the menu data associated by the link 80 corresponding to one selections of a menu screen based on the information 70and the information 73 is the menu data associated by the link 81 corresponding to one selections of a menu screen based on the information 71 further.

[0065]Drawing 6 expresses an example of the screen image displayed on the indicator which the client 20 does not illustrate. The figure (a) shows the image of the initial menu screen displayed based on the information 70. The figure (b) shows the image of the portal site screen displayed based on the information 71. The figure (c) shows the image of the service screen displayed based on the information 73. The initial menu screen shown with powering on of the client 20 or initialization being performed in the figure (a) based on the information 70 is displayed. Hereif selections "2. information"

are chosen by cursorit will be displayed as the menu screen based on the information 71 related with this by the link 80 shows in the figure (b). If selections "3. information in front of a station" are chosen by cursorit will be displayed as the menu screen based on the information 73 related with this by the link 81 shows in the figure (c).
[0066]The client 20 has memorized the information 70 which is initial menu data beforehand to nonvolatile memory storage.
The information on the menu screen chosen from the display screen of this initial menu data by the user is acquired from a sources-of-information server one by one. Therebythe client 20 can always acquire the newest information that it changes every moment while stopping the amount of information which should be memorized to the minimum. In that casethe client 20 is storing the menu data acquired whenever it chose it as the cache memory 26 from each menu screen as much as possibleand aims at evasion of the re access to the menu data acquired in the past. Heresince the information 76 cannot be accumulated when the storage capacitance of the cache memory 26 is the dashed line range 85 of drawing 6when there is access to the information 76 againthe necessity of connecting with a sources-of-information server via the data communication network 24 arises.
[0067]Thussince the capacity of the cache memory 26 of the client 20 has restrictionin the client 20 in the 1st working example. It reconstructs suitably about the contents which accessed in the past and are accumulated into the cache memory 26 so that information required for the user of the client 20 or the client 20 may be efficiently accumulated according to the attribution information 27.
[0068]Drawing 7 expresses an example of the reconstruction processing of the memory information on the cache memory 26 of the client 20 shown at Step S55 of drawing 4. The client 20 analyzes the profile information of the client 20 and the preference information of the user of the client 20 which were first memorized beforehand as the attribution information 27 (Step S90).
[0069]Namelysince access frequency is updated or contents are newly acquired in Step S54when contents are reused in Step S53 of drawing 4From the preference information and profile information which were updatedit analyzes about the relevance of the information which should newly be storedand the information already stored in the cache memory 26and addition of a prioritysearch of compressible accumulation informationsearch of the accumulation information which can be deletedetc. are performed. For exampleaccumulation information is compressible by adding a priority so that it may replace with accumulation information with low access frequency and new receipt information may be storedor reducing the image quality of picture informationand the tone quality of sound information with reference to profile informationwhen the priority is low.
[0070]It is related with the information for one screen corresponding to the selections of each menu screen when the unit of the information accumulated in the cache memory 26 is menu data for one screen in the indicator which the client 20 does not

illustrate. Correlation of each of this information is changed by reconstruction of memory informationand serves as an important element for judging whether the priority added in the case of the analysis mentioned above and deletion are possible.
[0071]When the information which should be updated was storable in the cache memory 26 as a result of such analysis of the attribution information 27 and it is distinguished (step S91:Y)the priority first added by analysis is referred to. And when the priority is a higher rank from the priority of a certain information (step S92:Y)The information on a low-ranking priority is deleted from the cache memory 26 (Step S93)the new information which should newly be updated is stored in the cache memory 26 (Step S94)and a series of processings are ended (end).
[0072]Drawing 8 expresses notionally an example of the situation of storing of information which received from the sources-of-information server 21 in the cache memory 26 of the client 20 performed at Step S92 and Step S93. When acquisition of the information 76 had the priority higher than acquisition of the information 73 and it is distinguished by a user's idea among the attribution information 27 as a result of the analysis of preference informationthe information 73 is deleted from the cache memory 26and the information 76 is stored instead. Thenabout the information 72 already associated by the link 100 to the information 70while the link 101 is generated between the information 76the link to the deleted information 73 is eliminated.
[0073]Drawing 9 expresses notionally other examples of the situation of storing of information which received from the sources-of-information server 21 in the cache memory 26 of the client 20 performed at Step S92 and Step S93. When the priority of acquisition of the information 110 was higher than the information 76 and it is distinguished by a user's idea among the attribution information 27 as a result of the analysis of preference informationThe link 111 which is replaced with the link 101 to the information 76and is returned to the information 70 is generatedthe information 76 is deleted from the cache memory 26and the information 110 is stored. Thenthe link 112 is generated between the information 110 about the information 71 already associated by the link 80 to the information 70.
[0074]It returns to drawing 7 and explanation is continued. At Step S92the added priority as a result of the analysis of the attribution information 27From the priority of other informationwhen it is a low rank (step S92:N)based on the profile information of the client 20It is distinguished whether there are some to which the image quality of picture information and the tone quality of sound information can be reduced among the information already accumulated with reference to the information capacity and the information kind which were matched with accumulation information as drawing 3 showed (Step S95). As a resultwhen some were compressible and it is distinguished (step S95:Y)accumulation information is compressed by changing the image quality and the size of picture informationor reducing the tone quality of sound information (Step S96). Thenthe new information which should newly be updated is stored in the cache memory 26 (Step S94)and a series of processings are ended (end).

[0075]Drawing 10 expresses notionally an example of the situation of compression of information which received from the sources-of-information server 21 in the cache memory 26 of the client 20 performed at Step S96. Namelywhen it is distinguished out of the information already accumulated in the cache memory 26 with reference to the information capacity and the information kind which were matched with accumulation information as drawing 3 showed that compressible information is the information 71For examplealthough the client 20 has only the display ability of a monochrome imagewhen the picture information of the color picture is containedthe information 71 is compressed into the information 120 by performing subtractive color processing of a color picturechanging the image quality itself and a sizeor reducing the tone quality of sound information. And regeneration of the link 121 from the information 70 and the links 122 and 123 to the information 73 and 74 is carried out. Therebythe storing region of the new information in the cache memory 26 is made to increase.
[0076]Againit returns to drawing 7 and explanation is continued. When there was nothing compressible and it is distinguished at Step S95 (step S95:N)it is distinguished whether there are some which can be deleted from the access frequency of the profile information of the client 20 and preference informationetc. (Step S97). When some are eliminable (step S97:Y)the information is deleted (Step S98)the new information which should newly be updated is stored in the cache memory 26 (Step S94)and a series of processings are ended (end).
[0077]When the information which should be updated could not be stored in the cache memory 26 at Step S91 as a result of the analysis of the attribution information 27 and it is distinguished on the other hand (step S91:N)Or when there was no information which can be deleted at Step S97 and it is distinguished (step S97:N)a series of processings are ended as they are (end). In this caseeven if the information which it was going to store newly has access againthe necessity of connecting with a sources-of-information server via the data communication network 24 produces it.
[0078]Thusin the information service system in the 1st working example. The client 20 which requires acquisition of the variety of information stored in the sources-of-information server 21The acquisition information from the sources-of-information server 21 temporarily accumulated in the cache memory 25 by the agent program 28 of this GW device 23 via GW device 23It receives going round automaticallyor acquiring periodically according to the profile information of the client 20the user's preference informationand the communication attribute information on a data communication networkand utilizing a data communication network effectively. While the client 20 stores the receipt information from GW device 23 in the cache memory 26Since accumulation information was reconstructed in consideration of the relevance of the stored information based on the attribution information 27 at every accessUse of a useless communications network is omittedand even if it is a case where it is not connected with a data communication networkthe operation menu etc. which are easy to access for the client 20 and its user can be provided. Since the

capacity of the cache memory 26 of the client 20 can be used efficientlythe capacity of cache memory is stopped to the minimumlow power consumption and a miniaturization are attainedand portability is raised.

[0079]The 2nd working example[0080]Although he was trying to acquire the information which the client 20 required of GW device 23 from the sources-of-information server 21 based on preference informationprofile informationand communication attribute information with the optimal traffic in the information service system in the 1st working exampleit is not limited to this. In the information service system in the 2nd working example. Notifying preference informationprofile informationand communication attribute information from the client 20 to a sources-of-information servera sources-of-information server transmits the stored information in which a client carries out an acquisition request according to these each attribution information to GW device 23.

[0081]Drawing 11 expresses the outline of the composition of the information service system in the 2nd working example. Howeveridentical codes are given to the information service system and identical parts in the 1st working example shown in drawing 1and explanation is omitted. The point that the information service system in the 2nd working example differs from the 1st working exampleThe sources-of-information server 130 in which the client 20 stores the information which requires acquisitionThe attribution information 27 transmitted by this client 20 and the same attribution information 131 are memorizedIt is the point that information providers are the throughput and display ability of a clientthe optimal amount of information for a user's ideaqualityand transmit timingand can perform an offer of information efficiently based on this attribution information 131.

[0082]In this casethroughput and display ability of the client which uses informational service by the offer-of-information sideVarious tendencies required for efficient offer of the information of the user's idea can be totaledfor exampleinformational service which is not not only in grasp of advertising effectiveness but in the former that the time near the real time of advertising effectiveness is shown from an information provider to an advertiser is made possible. Therebythe advertiser can analyze his advertising effectiveness and can specify the most effective advertising methodfor example.

[0083]A user's economic burden and the burden of a communications network are mitigable by setting profile information and preference information as a client beforehand in the 1st and 2nd working example. By for examplethe thing for which the attribution information of the group of the profile information beforehand decided according to the use tendency of userssuch as "setting out as an office terminal" and "setting out as a terminal for sport lovers"and preference information sells the client set up in the manufacturer. The information optimal for a buyer is promptly and efficiently acquirable. By selling the attribution information according to this use tendency itselfand enabling it to set it as a clientthe user-friendly client for the user

of a client can be providedand characterization for expanding the sales network of a client further can be performed.
[0084]In the 1st and 2nd working examplethe profile information of a client and a user's preference information are the relations of privacyand when disclosing these attribution information to a communications networka GW deviceand a sources-of-information serverit is desirable again to perform suitable encryption and user authentication.
[0085]Although the communications system in this example explained further as what is connected only to one sources-of-information server via a wireless-data-transmission networkit is not limited to this. The same effect can be acquired even if two or more sources-of-information servers are accessible topologies like the Internet. It is the sameeven when a client and a GW device are united and are constituted.
[0086]By the user of the client not only in the client in the 1st working example mentioned above but the 2nd working example itself specifying the priority of specific preference informationor operating profile information temporarilyIt also becomes possible to raise the acquisition efficiency of the information from a sources-of-information server. Efficient use of the data communication network between these each device is enabled by notifying this specified attribution information to a GW device and a sources-of-information server at any time. Even when the change of such dynamic attribution information changes a client for a user's purposethe optimal information acquisition of it is attainedand it means that a sources-of-information server can be used efficiently.
[0087]
[Effect of the Invention]According to Claim 1Claim 5and the invention according to claim 8as explained aboveuse of a useless communications network is omittedand even if it is a case where it is not connected with a data communication networka client and the information that convenience is high for the user can be provided.
[0088]According to Claim 2Claim 6and the invention according to claim 9a gateway is made to intervene between a server and a clientSince it was made to perform acquisition and transmission of the provided information of a server to this gateway based on the communication attribute information on the data communication network between attribution informationa serverand a clientThe increase in efficiency of each data communication network and the load of a client are reducedand although throughput is lowthe user-friendly client for a user can be provided.
[0089]Furthermoreaccording to Claim 3Claim 7and the invention according to claim 10by the offer-of-information side. Various tendencies required for efficient offer of the information of the idea of the throughput and display ability of the client using informational serviceand its user can be totaledFor exampleinformational service which is not not only in grasp of advertising effectiveness but in the former that the time near the real time of advertising effectiveness is shown from an information

provider to an advertiser is made possible. Therebythe advertiser can analyze his advertising effectiveness and can specify the most effective advertising method.
[0090]Since it enabled it to change each attribution information dynamically from a client further again according to Claim 4 and the invention according to claim 11client information and communication attribute information are temporarily operatedfor example from a clientand it also becomes possible to raise the acquisition efficiency of the information from a sources-of-information server. If this changed attribution information is suitably notified to a gateway or a serverefficient use of the data communication network between these each device will be enabled. Even when the change of such dynamic attribution information changes a client for the purpose of the user of a clientthe optimal information acquisition of it is attainedand it means that a server can be used efficiently.
[0091]Since the capacity of the accumulation means of a client can be used efficiently further again according to Claim 12 and the invention according to claim 13the capacity is stopped to the minimumlow power consumption and a miniaturization are attainedand portability is raised.
[0092]Furthermoreaccording to the invention according to claim 14it is applicable to a WAP system.
[0093]According to the invention according to claim 15further again by performing specific setting outsuch as "setting out as an office terminal"and "setting out as a terminal for sport lovers"for example. The user suitable for this setting out can acquire informationincluding contents etc.in the optimal situation immediately after a use startand can ease a user's economic burden and the burden of a communications network.
[0094]Furthermoreaccording to the invention according to claim 16while being able to provide the user-friendly client for the user of a clientcharacterization for expanding the sales network of a client can be performed.

## DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1]It is a lineblock diagram showing the outline of the composition of the information service system in the 1st working example of this invention.
[Drawing 2]It is a sequence diagram showing the outline of a series of information acquisition sequences of the information service system in the 1st working example.
[Drawing 3]It is an explanatory view showing the outline of the composition of the memory information on the cache memory of the client in the 1st working example.
[Drawing 4]It is a flow chart showing an example of the contents of processing of the sources-of-information server access processing by the client in the 1st working example.

[Drawing 5]It is an explanatory view showing notionally signs that the information received from the sources-of-information server is accumulated in the cache memory of the client in the 1st working example.
[Drawing 6]It is an explanatory view showing an example of the screen image displayed on the indicator of the client in the 1st working example.
[Drawing 7]It is a flow chart showing an example of the reconstruction processing of the memory information on the cache memory of the client in the 1st working example.
[Drawing 8]It is an explanatory view showing notionally an example of the situation of storing of information which received from the sources-of-information server in the cache memory of the client in the 1st working example.
[Drawing 9]It is an explanatory view showing notionally other examples of the situation of storing of information which received from the sources-of-information server in the cache memory of the client in the 1st working example.
[Drawing 10]It is an explanatory view showing notionally an example of the situation of compression of information which received from the sources-of-information server in the cache memory of the client in the 1st working example.
[Drawing 11]It is a lineblock diagram showing the outline of the composition of the information service system in the 2nd working example of this invention.
[Drawing 12]It is a lineblock diagram showing an example of the composition of an information service system by which the conventional proposal was made.
[Description of Notations]
10 and 20 Client
11 and 21 Sources-of-information server
12142224 data communication networks
1323 GW devices
1525and 26 Cache memory
27 and 131 Attribution information
28 Agent program